

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US05/10217

## Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.: 32-36  
because they relate to subject matter not required to be searched by this Authority, namely:  
A "coating" per se cannot be patented because it does not exist by itself; once it is removed from that which it coats it ceases to be a coating and becomes a different entity, such as a film/mixture/composition/.../substance/material.
2. ☐ Claims Nos.:  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:  
Please See Continuation Sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☒ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of any additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

- Remark on Protest
- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
  - ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
  - ☐ No protest accompanied the payment of additional search fees.

## INTERNATIONAL SEARCH REPORT

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Continuation of Item 4 of the first sheet:

A(3-n)XnN@C80 Endohedral Metallofullerenes as Lubricant or Additive, Corrosion-Resistant Coating, and Thermally-Conductive Materials

### BOX III. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group 1, claim(s) 1-6, drawn to lubricants.

Group 2, claim(s) 7-12, drawn to methods of making lubricant.

Group 3, claim(s) 13-18, drawn to methods of lubricating.

Group 4, claim(s) 19-24, drawn to lubricant additives.

Group 5, claim(s) 25-30, drawn to methods of making lubricant additive.

Group 6, claim(s) 31, drawn to methods of lubricating.

Group 7, claim(s) 37, drawn to articles having a corrosion-resistant coating.

Group 8, claim(s) 38-40, drawn to methods of inhibiting corrosion.

Group 9, claim(s) 41-44, drawn to thermally conductive materials.

Group 10, claim(s) 45, drawn to methods of making thermally conductive materials.

The inventions listed as Groups 1-10 do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The common technical feature to all the claims is TRIMETASPHERE. Since this is admittedly known, it is not inventive, and thus the claims lack a unity of invention.

## INTERNATIONAL SEARCH REPORT

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Continuation of B. FIELDS SEARCHED Item 3:

EAST, ALL US DBS: (trimetaspere endohedral adj metallofullerene endohedral adj metallo adj fullerene) and (lubrication lubricant lubricate tribol\$ corrosi\$ anticorrosi\$ coat coating film).

EPO, JPO, DERWENT, IBMTDB: (trimetaspere endohedral adj metallofullerene endohedral adj metallo adj fullerene) and (lubrication lubricant lubricate tribol\$ corrosi\$ anticorrosi\$ coat coating film).

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## A. CLASSIFICATION OF SUBJECT MATTER

IPC: C10M 125/20( 2006.01);173/00( 2006.01);F16C 33/12( 2006.01);C23F 11/00( 2006.01)

USPC: 508/102,108,114-129;106/14.05-14.45

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 508/102,108,114-129;106/14.05-14.45 (MODIFIED BY TEXT)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
Please See Continuation Sheet

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6303760B1 (DORN et al.) 16 October 2001 (16.10.2001), column 6, lines 25-43;	1-4,7-10,13-16,19-
—	examples 1-5; column 3, lines 22-3.	31,37-45
Y	WO 01/66676A2 (TENNE et al.) 13 September 2001 (13.09.2001), page 4, lines 18-26;	5,6,11,12,17,18
	page 5, lines 12-20.	5,6,11,12,17,18
Y	US 6432887B1 (YAMAMOTO et al.) 13 August 2002 (13.08.2002), column 10, line 59 to	5,6,11,12,17,18
	column 11, line 8; column 11, lines 36-50.	
Y	US 5269953A (WHEWELL) 14 December 1993 (14.12.1993), column 2, lines 36-42;	5,6,11,12,17,18
	column 4, lines 17-53.	
A	US 2002/0042348A1 (MCNEIL et al.) 11 April 2002 (11.04.2002), paragraph [0049],	
	examples.	
A	US 2004/0054151A1 (DORN et al.) 18 March 2004 (18.03.2004).	

☒ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

Special categories of cited documents:		
"A" document defining the general state of the art which is not considered to be of particular relevance	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent published on or after the international filing date	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means		
"P" document published prior to the international filing date but later than the priority date claimed	"&"	document member of the same patent family

Date of the actual completion of the international search

23 March 2006 (23.03.2006)

Date of mailing of the international search report

18 APR 2006

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

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- Remark on Protest
- |                          |   |
|--------------------------|---|
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